

RAPID METHOD FOR DETERMINING WATER CONTENT IN OYSTER TISSUE

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Medcof (1941) defined Condition Index (CI) as the ratio of the dry weight of the meat to the volume of the space between the valves $\times 1000$. To dry the meat, Engle (1958) used 72 hours exposure at 90° C. in a convection-type oven. This will reduce a 25 g. sample to constant weight; however, it is frequently desirable to avoid the 72-hour waiting period.

Korringa (1956) reported a method by which the water content of oyster meats could be determined volumetrically using toluene distillation. The homogenized sample was placed in a flask and covered with toluene. The flask was connected to a condenser fitted with a distillation trap and maintained at 100° C. for 1 hour. The volume of water collected was measured and converted to weight. The total time required was about 1 hour. We were unable to get the reproducible accuracy desired because of the tenacity with which small droplets of water adhered to the sides of the condenser and fittings. To overcome this problem we devised a gravimetric adaptation of Korringa's method which eliminates the condenser and its associated problems and in which the weight of water is determined directly. This adaptation is discussed below.

Figure 1 shows all major components of the apparatus. The function of the intake drying

tubes is to provide an atmosphere free of moisture. A 10 g. sample of homogenized oyster tissue is covered with toluene and heated to 100° C. for 45 minutes. The water vapor is collected in the tared outlet drying tubes. All tubes contain the drying agent, calcium chloride. Plastic check valves control direction of water vapor flow. The number of drying tubes needed can be determined by a trial run in which weights of the individual tubes are recorded. The last tube in direction of flow on both sides of the flask should not show a weight increase. In practice, once the proper number of tubes is determined, the tubes can be weighed as a unit. Suction should be applied very gently. With this method, we have been able to produce the same accuracy in 45 minutes that requires 72 hours in a conventional drying oven.

LITERATURE CITED

- ENGLE, JAMES B.
1958. The seasonal significance of total solids of oysters in commercial exploitation. Proc. Nat. Shellfish. Ass. 48: 72-78.
- KORRINGA, P.
1955. Qualitätsbestimmungen an Miesmuscheln und Austern. Arch. Fischereiwiss. 6: 189-193. (Translation by N. M. Carter. 1956. Quality determinations of mussels (*Mytilus edulis*) and oysters. Fish. Res. B. Can., Transl. Ser. 76.)
- MEDCOF, J. C.
1941. The influence of temperature and salinity on the condition of oysters (*Ostrea virginicus*). J. Fish. Res. B. Can. 3: 253-257.

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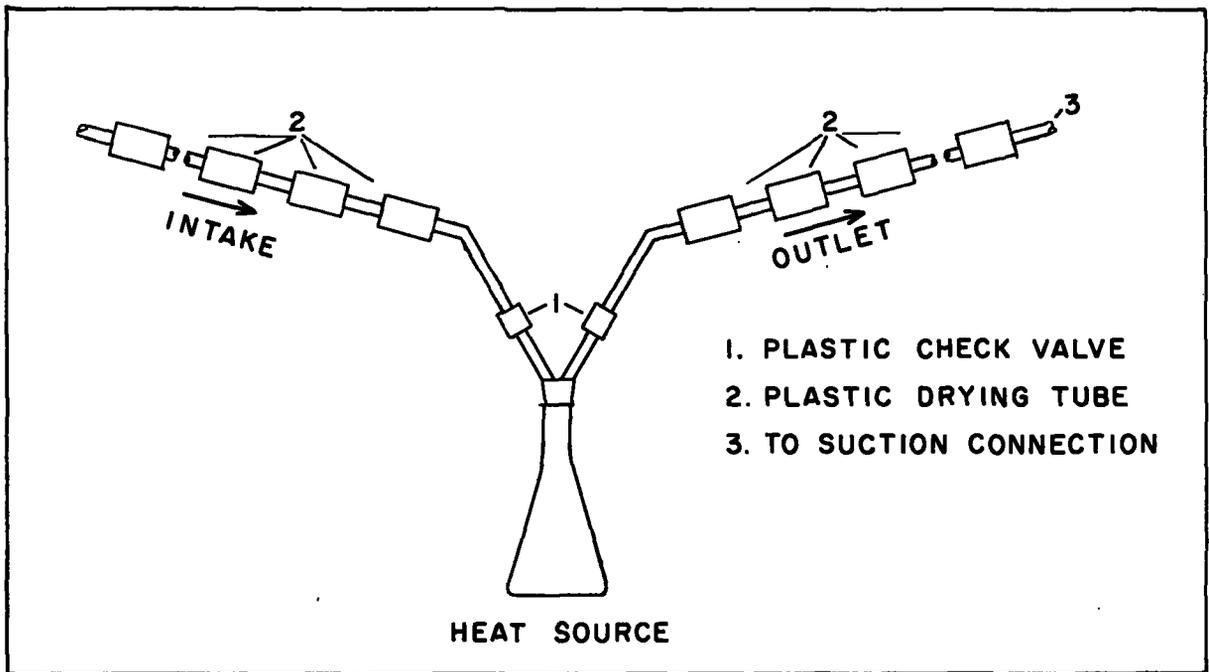


FIGURE 1.—Diagram of extraction apparatus.